REMARKS

Claims 5-9 and 17-19 remain in the application. Independent claims 1, 12 and 13, and dependent claims 2-4, 10, 11, 14-16 are canceled.

Claims 7, 18, and 19 have been amended to place them in independent form, including the limitations of the claims from which they depended.

When interpreting the instant claims, it may be noted that the term "very high frequency" (VHF) is defined in the Shen reference, at col. 1, lines 21-23, and in the instant application in paragraph [0002], as a frequency above the lamp's highest acoustic resonance.

Art rejection - US 5,684,367 (hereinafter "Moskowitz")

To the extent that the rejection over Moskowitz might be maintained against previously presented claims 5, 6 and 17, reconsideration is requested because Moskowitz does not teach nor suggest that an arc-straightening frequency or frequency sweep signal is or might be summed with a carrier frequency signal, thereby obtaining difference power frequencies that excite an arc straightening acoustic mode.

Independent claims 5 and 17 require summing the carrier frequency signal with a second signal to obtain power frequency signals which excite an arc straightening acoustic mode. This is shown in Fig. 3B and described in paragraphs [0012] and [0048].

To the contrary, Moskowitz discloses amplitude modulating a 250 kHz carrier with a swept wave generally swept from about 20 kHz to 60 kHz, where the swept wave is formed so as to center, constrict, and stabilize the arc. Moskowitz clearly teaches that in all embodiments the carrier frequency (the higher frequency) is amplitude modulated by the lower frequency (swept frequency) to produce arc straightening.

Those of ordinary skill know that summing two frequencies, versus amplitude modulating the higher frequency by the lower, requires different circuitry and produces results which are different mathematically and physically. Neither process or apparatus suggests the other.

Accordingly claims 5, 6 and 17 are patentable over Moskowitz.

Art rejection – Moskowitz in view of US 6,498,441 (hereinafter "Shen")

To the extent that the rejection of claims 7-9, 18, and 19 over Moskowitz in view of Shen

might be maintained against the amended claims 7, 18 and 19 and previously presented claims 8 and 9, reconsideration is requested for the following reasons.

Claims 7 and 18

The teachings of Moskowitz are described above. Moskowitz is silent with regard to first and second longitudinal resonances and first radial resonance.

Shen discloses a method of preventing vertical color separation in HID lamps, by controlling a supply of VHF (very high frequency) electrical power supplied to the lamp so as to excite the second longitudinal acoustic mode. To excite this mode, power to the lamp must be modulated at the frequency of the second longitudinal acoustic mode. According to the Shen disclosure (col. 2, lines 36-64), when the lamp has a second longitudinal acoustic mode at 24 kHz, the duty cycle of the inverter is switched or otherwise varied between two values, such as 50% and 40%, at a frequency of 12 kHz, thereby modulating the load power at a frequency of 24 kHz. The degree of excitation of the acoustic mode can be varied and controlled by changing the amount of variation of the duty cycle. Shen teaches that it also is desirable to maintain a constant switching frequency of the (preferably half bridge) inverter (col. 1, lines 42-51).

The duty cycle can be modulated by various symmetrical waveform functions, for example sinusoidal (col. 3, lines 4-17). The modulation index is varied according to the amount of excitation of the second longitudinal acoustic mode that is desired (col. 3, lines 20-24). So long as the carrier frequency is reasonably higher than the modulating frequency the modulated power is independent of the carrier frequency, which can therefore be either fixed or swept, for example from 450 kHz to 550 kHz. (col. 3, lines 27-35).

The above discussion makes clear that nothing in either Moskowitz or Shen refers to alternation in time between applying the carrier frequency continuously and applying a frequency or frequency sweep signal whose frequency is half the frequency of the power signal required for arc straightening.

The waveform envelopes defined by claims 7 and 18 are shown in Figs. 8 and 9, and described in paragraph [0049]. The high amplitude envelope portion is pure carrier frequency, while the low, shorter portion is pure lower frequency or swept lower frequency.

Combining the references

If one or ordinary skill were to devise a best combination of Moskowitz and Shen, one might alternate between a pure carrier power pulse, and then a long period of modulated carrier frequency with sweeping the frequency of duty cycle modulation or combining duty cycle modulation and swept-frequency amplitude modulation. One of ordinary skill would not find in either of these references, or their combination, any suggestion to alternate between pure carrier frequency and pure lower frequency.

Accordingly claims 7 and 18 are patentable over Moskowitz and Shen.

Claim 8

Claim 8 is patentable for the reasons given for claim 7.

Claim 9

As described above, neither reference refers to the first azimuthal and first radial modes. Accordingly no combination of these references suggests the frequency limitations contained in claim 9.

Claim 19

As amended, claim 19 places limitations on the arc tube aspect ratio which are not taught nor suggested in either Moskowitz or Shen. These limitations, combined with the claimed excitation circuit, are therefore not suggested by either patent or their combination.

Accordingly claim 19 is patentable over Moskowitz and Shen.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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